

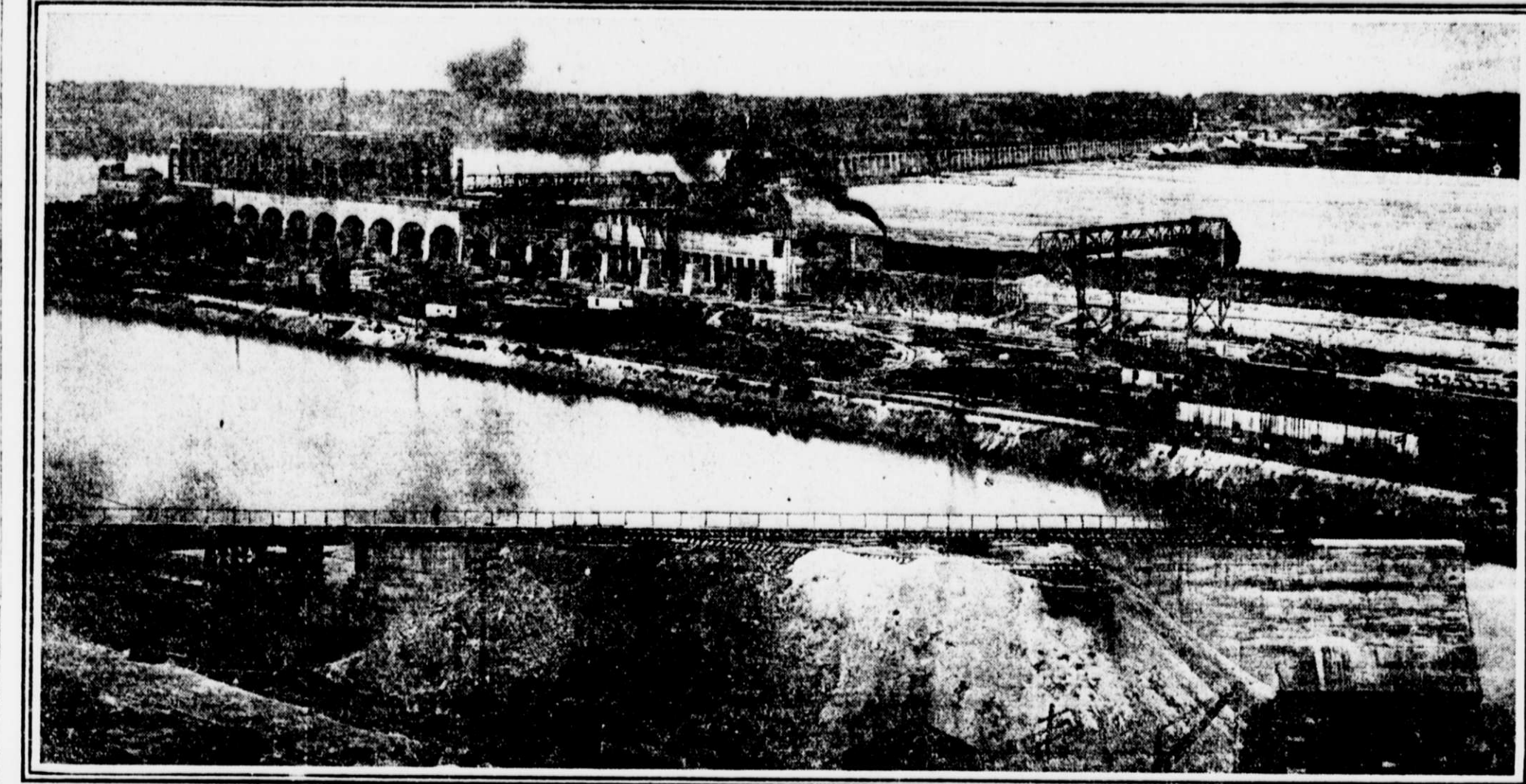
SQUEEZING IMMENSE POWER FROM THE MISSISSIPPI

Mighty Dam at Keokuk, Ia., Rivals Parts of Panama Canal Structures

ACROSS the Mississippi River at Keokuk, Ia., men are building the mightiest power dam in the world. Immense structures are going up there in the heart of the continent that will dam up America's greatest river, structures whose size are in keeping with the river's immensity, structures whose dimensions have not an equal in the whole world.

Remember those pictures of "the old mill stream" where a creek of water comes floating along in a narrow ditch on top of an embankment and then suddenly spills over a paddle wheel just beneath the end of that ditch? And at the side of the wheel stands an old moss covered mill whose machinery the wheel is supposed to turn. And green blades of grass stick up all along the little, narrow, peaceful brook and the pebbles are brown and covered with a waving, mossy growth where the water splashes off the wheel to the ground beneath. And in the clover field close by an old yellow cow gazes meditatively at toward the shimmering horizon and almost seems to chew at the few blades of grass sticking out of her mouth. Remember those pictures? Such was the old mill of early days and the old mill-wheel. The meditative cow and her chaw of grass was no part of wheel or mill, we hasten to add, simply part of the stage setting that set off the peacefulness of the scene.

'Tis a far cry from that old mill and rickety waterwheel and meditative cow of early days to the sort of machinery and structures they are putting up in this Keokuk installation. A bovine creature that was inclined to stand anywhere around the construction work at that place and ponder on things in general would be converted—we have to say it—something tells us she would be converted into soap bones and sausage ere her meditations had gotten beyond the embryo stage. Great towering concrete structures, banging, swinging, clattering machinery and hundreds upon hundreds of workmen fill the gigantic cofferdam where the work is going on and the dreamy cow that got in the way of all that—we have to think of it, brethren. But enough of this, as some poet once remarked. We cannot pause here to describe the different structures and all the vast construction work that the builders of this mighty harness for the Mississippi have put up. Much has been said and written on the appearance and economic aspects of the great project. For you who hunger to know how the



LARGEST SINGLE POWER DEVELOPMENT PLANT IN WORLD LOCATED NEAR HAMILTON, ILL. A LOCK IS TO BE CONSTRUCTED GREATER IN LIFT THAN THOSE USED AT PANAMA.

thing is to work, how the builders plan to get power from the sleepy and indolent Mississippi, how their plan differs from the simple wheel and mill race of early days, this article is written.

But first let us pause and consider some of the general attributes of all water power developments. The first requisite in the seeking to get power from any river is to find a place where a comparatively steep fall in a short distance of travel. The second is to erect a dam at the foot of the fall, staunch enough to hold up the water and concentrate the fall of the river to one place at the side of the dam. The third must be to put up a power house of suitable design to utilize the power from the fall of the water, and the fourth and last requisite, if the river be navigable, is to provide a lock to let boats past the dam.

The first requirement, that of having

a steep fall to the river, is satisfied in this Mississippi Valley development by the Des Moines rapids in the Mississippi, which extends for twelve miles above Keokuk. The river falls twenty-three feet in those twelve miles. Not a very big fall to be stretched out over a mile wide as you think, but when you stop to consider that if the drowsy Mississippi falls one lone solitary inch for any other mile of its length it is lucky, then this twenty-three feet to twelve miles looms up larger. Then too, the Mississippi is something around a mile wide at Keokuk, and when you get a stream a mile wide to fall twenty-three feet there is going to be some power resulting. Moreover, the Des Moines rapids are bounded on both sides by steep hills, which is a very material factor when a dam is placed at the foot of a falls and start out to figure the amount of ground the resulting lake will overflow. Having a line

of hills close on each side of course will limit materially the amount overflowed. Nowhere else along the whole length of the Mississippi is there so steep a fall in so short a distance or a fall so well conined between steep hills.

The second step mentioned in the process of getting power from the river was to dam up the stream and concentrate the fall made over the entire length of the rapids to one place, where the waters could be run through a power house and their energy squeezed out. This necessary dam the builders of the Keokuk project have now practically finished. For seven-eighths of a mile it stretches out over the broad bottom of the Mississippi from a firm anchorage on the Illinois shore. It is fifty-two feet high and wide enough on top to support three standard gauge railroad tracks side by side for the use of construction trains. It is not one solid wall, but is composed of a series of

close set arches, 119 in all, something on the order of a concrete bridge, only the supporting piers are closer together. The reason the dam was made in this way was that when too much water accumulated above its walls for the use of the power house the surplus could be permitted to slide through the dam by opening the steel gates that will fill the gaps between the piers.

Then, too, the Government specified that such construction be made from considerations having to do with minimum flow of water in the river below the dam.

The general type of agent to do the direct squeezing of the power from the Mississippi is the Francis turbine. Let us go back a little and consider the different agents used in other developments in days gone by. The first means of getting power from a falls was the old paddlewheel, such as we described at the beginning of this article. The

water either went over it or under it, and it was known as the "overshot" or "undershot" wheel accordingly. This type of wheel has been used since time immemorial. Its efficiency is very low.

The principal of the turbine next was applied to waterwheels in an effort to increase this efficiency, and a mark as high as 80 per cent. was attained. The turbines were of the reaction type; that is, a body of water under pressure was admitted to the hub of a wheel, whose axis was vertical and ejected at an angle from its periphery. The ordinary revolving lawn sprinkler is a reaction turbine of a simple kind and works on the same principle.

After the reaction turbine had been used for some time, a man named Francis made an improvement in his design, succeeding in getting even greater efficiency. He just reversed the circulatory path of the water—he

River a Mile Broad and Falls Twenty-three Feet in Twelve Miles

admitted it to the periphery of the wheel and ejected it at the centre. In these especially designed Francis turbines, at Keokuk, an efficiency of 86 per cent. will be attained, higher by at least 6 per cent. than ever before.

The power house containing these turbines stands at right angles practically to the dam itself and to its upper corner the west end of that structure is anchored. The substructure, the part containing the turbines, is completed and the superstructure, to house the electric generators and accessories, is in process of construction. When at last the project is completed and the structures put to use, the waters held up by the dam will sweep around the corner of this power house and surge through a series of 120 openings in the foundation wall to the turbines beneath. There will be fifteen turbines of 10,000 horse-power each in the initial installation, and fifteen more in the second part to be built while the first is in operation. The volume of water lending to each turbine will be so great that no ordinary pipes could be used to conduct it. So in the basement of this power house they have moulded great passageways in the concrete to carry the water from the outside to the turbines.

Each passageway is big enough to contain a load of hay without crowding. To properly handle such an immense body of water the turbines had to be made several times larger than any heretofore used. They are sixteen feet in diameter, and the cases that contain them are great chambers in the concrete in which a house might be built thirty-nine feet in diameter and twenty-two feet high.

The power house, when fully completed will be nearly 2,000 feet long and more than 100 feet high, three times larger than any heretofore built. Its capacity will be up to 300,000 horse-power, which is more than half all five companies develop at Niagara.

The fourth requirement to get power from a river, that of having a lock to let boats by the dam, the builders of this project are satisfying by the erection of a structure for the purpose that outlasts those in the Panama Canal. This lock is 110 feet wide and has a lift of forty feet, greater in lift by eight feet than any of the terraced locks that will lift boats over the mountains at Panama.

The Government required that it be made a present of the lock when completed before it would give the developing company a franchise for the dam, and also required that a dry dock be built beside the lock so Uncle Sam might have a place to build and repair boats. The two structures will cost in the neighborhood of \$2,000,000 to complete. All construction work will be completed by May 1, 1913.

YOUNG WOMAN WHO HELPED TO NOMINATE CANDIDATE WOODROW WILSON

IT was on one of the hottest days in July, 1911, about a week after work on the famous McComb's Doo-doo-doo had been begun in the Woodrow Wilson headquarters at 42 Broadway, that the office manager summoned his secretary and regarded her with sad eyes.

salary with not a bit of glory thrown in to brighten the dullness of the daily routine. The manager who gave her a chance to show what she could do resigned his place in a few months, and the one who succeeded him has in turn given way to a third, but the twenty-year-old girl stayed right on the

the various delegates in the convention and trying to fit them to the descriptions I had written of them. Lots of them knew about it, but they were perfectly lovely about it and didn't seem to mind a bit. Ever so many of them gave me their badges to keep. I think I have at least one from every State in the Union and several from a number of them.

"Of course I wasn't as much worried over the outcome of the convention as many of the Governor's supporters were, because I had the advantage of much of the inside information which made the leaders of his campaign perfectly certain from the beginning that I was the only one who would know just what happened. I knew, for instance, from my own records that lots of the delegates who were voting for other candidates had Wilson as their second choice and would come out on his side as soon as they had delivered enough courtesy votes for favoring him.

"The announcement of the nomination was tremendously exciting on account of the wild enthusiasm of the delegates and the galleries, but it didn't come as a bit of a surprise to me. I was sure of it long before we went to Baltimore. Why, don't you remember I said six months ago when I first began to wear a Wilson button that he was the man who would lead the Democratic party to victory?

"It was quite true. She had said so several times. She admitted, nevertheless, that the convention proceedings were sufficiently thrilling all the way through to make her forget all about the grand suffrage parade which came off the evening of the nominating speeches were made.

"I don't believe I would have forgotten it," she said, "if it hadn't been scheduled for the night before and postponed on account of rain. I remembered the first date all right and was on hand at the appointed place and time with the purple, white and green banner of the Women's Political Union which I had promised to carry. No one else turned up to march, so after a while I went back to the hotel.

"I am and always shall be the strongest kind of suffragist, but I don't think I showed any disloyalty to the cause to stay out of a parade from which I probably was missed at all when that perfectly thrilling night session was going on. I stayed right there in the hall from 6 o'clock in the afternoon until 7 o'clock the next morning.

"I was just a bit sleepy the rest of that day, but I managed to put in my allotted time at headquarters answering all sorts of inquiries and superintending the distribution of flags, buttons and literature. You see, I had had charge of the literature in the New York office for so long that I had come to have the idea that I was the only one who would know just what happened. I would meet a particular case, and I hated to stay away even for a day before the Governor actually had the nomination.

"Miss Hill is now commencing a second Doo-doo-doo Book in which she is setting down facts concerning possible returns from the Bill Moose ranks and even from the regular Republican party, and in her spare moments she dictates answers to some of the thousands of letters which have been received at headquarters since the convention. She simply shares the work, she says, and doesn't mind in the least when she has to put in a few hours of extra time.

"She is so filled, in fact, with campaign enthusiasm that without even trying to think or consult a memorandum she can give you twenty to thirty names who there is no doubt whatever concerning a Wilson victory. When she finishes she sees a shadow of doubt on the face of a listener and how it is possible that any one can be so dense as not to see clearly the finger of Providence in the whole Wilson boom right from the very beginning. Then she patiently explains that there are great moral issues involved and that she is sure the American people will see that the right wins and it is a Democratic year anyway.

And then she grows, if possible, even more enthusiastic as she tells you that

she has been promised a perfectly lovely office in Washington next spring after the inauguration, and that she has decided to study law in the evenings, so that when women get the vote she will be fully equipped for a political career.

"You know suffrage seems a more commonplace to me," she said, "for I was born in a country where women have voted for years."

Then you remember with regret that this "typical American girl" isn't really an American at all. She was born in Sydney, New South Wales, twenty-one years ago, and moved with her parents to Kobe, Japan, when she was five years old. She speaks French as well as she does English, but she always dreams in Japanese, and she and her mother converse in Japanese when they are alone.

Kobe is the most beautiful city in the world, Miss Hill declares, and she was heartbroken when she had to leave it in 1904. After travelling about for two or three years in the West Miss Hill came to New York with her mother, and when she was sixteen a place in the office of the Equality League of Self-Supporting Women, the organization of which Mrs. Harriot Stanton Blatch is president, and which has since changed its name to the Women's Political Union.

Mrs. Blatch soon discovered that the demure, English young person whom she had engaged to address envelopes and to take telephone messages had a more intelligent grasp of the real points at issue in the suffrage movement than that possessed by many women more than twice her age who had been shouting "Votes for women" for years, and she began to take her to street meetings and let her distribute literature among the crowd. There came a day when she was told to make a two minute speech from the soap box platform, just to see how she would do.

The crowd cheered her to the echo before she had a chance to utter a sentence, and for the next four years she was a prominent figure in every public demonstration made

by the Women's Political Union. She learned all about the voting machinery of New York city on election day in 1908, when under the guidance of Mrs. Blatch she and half a dozen other young suffragists visited polling places, giving away buttons and equal franchise dodgers.

The next year she was one of the women

experience that although the latter were always willing to grant her an interview they were unable to remember later on after all she wasn't a constituent or even a relative of one.

After much persuading she induced a newspaper editor to let her Omeida women to go to Norwich to the Democratic Senatorial



MISS ALBERTA HILL.

"I regret to say," he began with a tinge of regret in his tone, "that you are the finest stenographer I have ever seen."

The secretary, a slender girl with brown hair and eyes to match, looked surprised but not surprised.

"It is so hard for me to read my notes," she sighed.

"It is really a waste of time," continued the manager with judicial severity, "to dictate to you at all."

"I think," ventured the secretary timidly, "that I could get along better with the book if you didn't."

The manager stared incredulously, and then he laughed.

"Now that I come to think of it," he said, "I believe you are the first young woman I have ever met who seemed to comprehend the difference between a Congressman and an Assemblyman. Suppose you sit at that desk over there and see what you can do with the material. Use the abstracts I have made as models."

If Miss Alberta Hill had been an expert stenographer and typewriter it is not probable that she would now be known as the Wilson mascot of the Baltimore convention or that she would be directing the work of dozens of men and women in the national Democratic campaign headquarters. She would in all likelihood still be taking letters at something less than half her present

job. She has made dozens of thousands and thousands of letters from all parts of the United States treating of the personal characteristics and public and private records of Democratic Congressmen from every State, Democratic members of all the State Legislatures, and the Democratic national, State and county committees, and the rank and file of the members of upward of two hundred Wilson clubs.

"Loads and loads of these men were so strong for Gov. Wilson," she explained the other day, "that I put special marks after their names to show that our own committee wouldn't have to do any work with them. Their digests just told what kind of work they could do best and how much we could depend on them for."

"Some of the doubtful ones had flood prejudices or pet vanities which had to be taken into consideration, and after setting these down as briefly and as clearly as possible I used to line on it from the correspondence in my possession, what seemed to be the best method of approaching them. The list wasn't by any means complete before the convention and the girls who were attending to the mechanical end of it were furious because they had to work evenings.

"It was lots of fun, though, picking out



THEY GAVE UP THEIR BADGES TO KEEP.

SPONGES MORE IN DEMAND AND PRICES GO UP

The stock in New York's sponge market is getting low, at least that is the report current among the dealers. One firm reports that owing to the lack of sponges the prices of the medium and low grades have gone up 150 per cent.

"How do you account for this situation?" a dealer was asked.

"New York is getting cleaner," was the quick response. "More sponges are used this year than last by two-thirds, and last year more sponges were used than the year before, and so it has been going for a long time.

"Then, too, we get better sponges from our own fields in Florida than ever before. Time was when we imported all of them. They came from the

coast of Smyrna, where the sponges were all gathered by divers.

"All of our sponges are gathered with poles. Two fishermen go out together, generally, one to paddle or scull the boat and the other to fish for sponges. The latter has a bucket with a glass bottom, through which he constantly watches the bottom of the water for a catch. When one is seen he lets the bucket go and with both hands on the long pole, sometimes forty-five feet long, he hooks a sponge, gives the pole a little twist of the wrist and pulls up. If a good sized sheep's wool is landed, that one haul is worth from \$1 to \$1.50 to the men.

"The dirty, evil smelling things

brought up by the sponge fishers are not what the cleaned up sponges look like in the shop. They are left in the kraals for a week to soak out, and then beaten with a stick until every particle of animal matter is whipped out of them. Then they are hung up to dry on long strings.

The Key West sailors like to work and make from \$30 a month up. Possibly ninety boats go out from that port every spring and sail as far as Miami—75 miles. The Rock Island sponges are accounted among the best by the fishermen. Here the water is cool and deep, and the men make fully \$100 in a cruise of eight weeks.

"Of all the Florida sponges the sheep's wool is the best; then comes the grass sponge, which is worth three or four times as much as a yellow sponge, the cheapest grade."



THE CROWD CHEERED HER TO THE ECHO.

appointed by the Prohibition party to watch its interests at the polls, and she made a speech that took the men by storm. She spoke before the Republican county convention at Wampsville. Both candidates promised that they would give their serious attention to the consideration of the bill she was pushing.

But whatever she may accomplish for the cause in years to come, Miss Hill will always consider the 1911 parade the climax of her suffrage career. She was chosen from among 5,000 women to lead the great May 6 procession, and according to the newspapers the next day the public approved the selection.

Briefly expressed the consensus of male opinion among the spectators seemed to be that "if all the suffragists looked like that they could vote whenever they pleased."

But it won't do to describe in detail her appearance on that occasion, because she insisted that as little as possible be said about her age or her looks.

"Now that I am working with men in a real political campaign, it sounds horribly undignified, doesn't it?" she said. "It is only 'that I know and what I can do that counts, and if the National Committee should get the idea that I am vain and frivolous they wouldn't have a bit of confidence in my ability."

Perhaps she is right.